

What is Claimed is:

1 1. A system for reducing noise in a wideband signal having at least one narrow frequency
2 component comprising:

3 a filterbank comprising a first filter having a first frequency and a first output and a
4 second filter having a second frequency and a second output, wherein the phases of said first
5 frequency and said second frequency differ by 180 degrees about a third frequency;

6 a running cross-correlator interconnected to said first filterbank for comparing said first
7 output of said first filter and said second output of said second filter; and

8 an analysis-synthesis filterbank for attenuating said wideband signal at said third
9 frequency in response to said running cross-correlator.

1 2. The system of claim 1, further comprising first and second saturating non-linearity
2 components interconnecting said first filter and said second filter, respectively, to said running
3 cross-correlator.

1 3. The system of claim 2, wherein said first and second saturated non-linearity components
2 are signum functions.

1 4. The system of claim 1, wherein said running cross-correlator comprises a cross-correlator
2 interconnected to a low-pass filter.

1 5. The system of claim 1, wherein said second filterbank attenuates said third frequency only
2 when said running cross-correlator has a reduced response.

1 6. A method for reducing noise in a wideband signal, comprising the steps of:

2 (a) filtering said wideband noise at a first frequency to produce a first filter output;

3 (b) filtering said wideband noise at a second frequency to produce a second filter

4 output, wherein the phases of said first frequency and said second frequency differ by 180

5 degrees about an intermediate third frequency;

6 (c) performing a running cross-correlation of said first filter output and said second

7 filter output; and

8 (d) attenuating said wideband signal at said third frequency according to said running

9 cross-correlation.

1 7. The method of claim 6, further comprising the step of transforming said first filter output

2 and said second filter output with a saturated non-linearity component function prior to

3 performing said running cross-correlation.

1 8. The method of claim 6, further comprising the step of amplifying said wideband signal at

2 said third frequency if said running cross-correlation has a low value.

1 9. The method of claim 6, further comprising the steps of
2 (a) filtering said wideband noise at a fourth frequency to produce a fourth filter
3 output;
4 (b) filtering said wideband noise at a fifth frequency to produce a fifth filter output,
5 wherein the phases of said fourth frequency and said fifth frequency differ by 180 degrees at an
6 intermediate sixth frequency;
7 (c) performing a running cross-correlation of said saturated fourth filter output and
8 said saturated fifth filter output; and
9 (d) attenuating said wideband signal at said sixth frequency according to said running
10 cross-correlation.

1 10. The method of claim 9, further comprising the step of combining the attenuated signals of
2 steps (d) and (j).
1 11. The method of claim 6, wherein the step of attenuating said wideband signal at said third
2 frequency according to said running cross-correlation comprises passing said wideband signal
3 through an analysis-synthesis filterbank.